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# **Evaluation and use of indicators of insurance companies' investment activities**

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## Evaluation and use of indicators of insurance companies' investment activities

### Abstract

The paper offers a scientific and methodical approach to the evaluation of investment activities of insurance companies, develops investment strategies based on the correlation of investment characteristics, studies the current level of Ukrainian companies' investment activities in the area of life insurance and presents recommendations regarding the choice of the proper investment strategies.

**Keywords:** insurance company, investment potential, investment risk, efficiency, investment activity.

**JEL Classification:** G20, G22.

### Introduction

The intensification of globalization, the increasing convergence phenomena in the financial sector, the emergence of new financial instruments as well as the rapid development of information technologies stimulate the insurance market participants to implement new approaches and methods for insurance business management. Today the main challenge for insurance companies is not only in developing and promoting insurance products, but also in the efficient allocation of internal and borrowed resources. The efficiency of an insurance company's performance, the strengthening of its competitive position in the market, the growth of its market value largely depend on the level of the insurance company's investment activity. In this regard, we need to assess the insurance companies' investment activities and search for new opportunities of their intensification.

A significant contribution to the theoretical and methodological foundations of organization of insurance companies' investment activity was made by Heyman (2006), Rowland, Liebenberg (2010), Pottier (2007), Chen (2007), Babbel (2001), Thomas (2005) and others. However, the issue of quantitative and qualitative assessment of insurance companies' investment activities is not fully disclosed in spite of its relevance and practical significance. The purpose of this article is to assess the characteristics of insurance companies' investment activities and to find ways of improving their efficiency.

The investment activity of insurance companies means a purpose fully implemented process of investing both internal and borrowed funds (according to the legislation) in the objects of the economy's real and financial sectors in order to obtain economic benefits for both the insurer and the insured (for contracts of voluntary life insurance). Therefore, it is proposed to conduct the assessment of insurance companies' investment activity taking into account the interdependence of its following complex characteristics based on integrated indicators: investment

potential (characterizes the actual and potential investment resources), efficiency of investment activities (defines the realization of investment opportunities) and investment risk (reflects the real or potential like lihood of occurrence of insured events that may lead to a partial or complete loss of funds by the insurance company in carrying out investment activities).

We will analyze in more detail the mechanism of assessment of integrated indicators for each of the characteristics of insurance companies' investment activity.

We begin our study of insurance companies' investment activities by assessing the investment potential. Having analyzed the existing approaches to the assessment of insurance companies' investment potential [1, 4, 8, 9], it should be noted that most authors consider it as the sum of insurance reserves and equity capital. In our opinion, this approach does not take into account the complexity of investment potential, excluding the role of organizational and information provision of the investment process. Moreover, these approaches do not consider the potential increase of insurance companies' investment resources. The elimination of drawbacks in the assessment of investment potential is possible through the use of taxonomic method, which is based on the matrix of normalized data defining a vector of the "reference" indicator for a specific company and comparing it with separate indicators. It is offered to carry out the assessment of investment potential in terms of three subsystems: the resource subsystem – the level of equity capital ( $P_1$ ), the level of net insurance reserves ( $P_2$ ), the level of debt burden ( $P_3$ ), the ratio of insurance premiums to insurance reserves ( $P_4$ ), the level of unprofitability of insurance operations ( $P_5$ ), the share of reinsurance in insurance reserves ( $P_6$ ), the organizational subsystem – collaboration with Asset Management Company (AMC) ( $P_7$ ), the average length of service of executive officers ( $P_8$ ), the information subsystem – the level of automation of business processes ( $P_9$ ), the level of information disclosure ( $P_{10}$ ). Therefore, the determination of the level of an insurance company's investment potential

includes the assessment of the following parameters: the actual level of the insurance company's investment provision; the existing potential of the functioning participants of the life insurance market; opportunities for increasing the investment potential with regard to the existing conditions of the insurance market.

The next step in assessing the insurance company's investment activity is the calculation of its efficiency. The choice of this indicator is explained by the fact that its calculation will help determine the level of effectiveness and the quality of an insurance company's investment activity and to analyze the degree of its dependence on insurance activities. Thus, the investment and insurance activities are inextricably linked in terms of the coverage of operational losses due to the investment income as a result of an increased competition in the market and the corresponding dumping of insurance services' prices, as well as the occurrence of cumulative insured losses. The effectiveness of investment activities is assessed on the basis of parameters that characterize the size of investment income (the share of financial resources in the structure of assets ( $E_1$ ), the ratio of investment income to total income ( $E_2$ ), the ratio of investment income to investment premiums ( $E_3$ )), the amount of invested funds ( $E_4$ ), the share of investments in the structure of funding sources ( $E_5$ ), the adequacy of insurance reserves ( $E_6$ ).

A key element in the analysis of insurance companies' investment activity is the degree of their risk acceptance. As insurers perform the role of guarantors of financial stability of individual businesses and the economy as a whole, there is a clear need in identifying investment risks, their constant monitoring and quantitative assessment, identifying the causes and finding possible ways to minimize their negative impact. The main methods for the assessment of insurance companies' investment risks include:

1. The scenario approach based on the development of scenarios for various segments of the financial market with an indication of the forecast price and profitability of financial assets with the probability of occurrence of each scenario.
2. Stress testing – a range of methods used to assess possible changes in the value of investment objects in case of financial emergencies.
3. Methods of statistical analysis, which take into account the value of financial assets in the previous periods, making it possible not only to evaluate the impact of system factors, but also to determine the amount of potential losses for a certain period of time.

The most common methods of statistical analysis are:

- ♦ value-at-risk (VaR) – the monetary assessment of the maximum possible losses from a financial instrument in a specified period of time. To

measure the VaR the methods of correlation analysis, historical simulation and Monte Carlo method are used;

- ♦ short fall-at-risk (SaR) determines the average size of losses from investing in a specific financial instrument;
  - ♦ the mean square deviation;
  - ♦ the method of equivalent financial instrument uses a substitute financial instrument with similar characteristics while its costs considered a price of risk [12].
4. The coefficient approach, which makes it possible to identify the factors of the real potential loss of financial stability due to the deterioration in the quality of the investment portfolio.

In this study, the assessment of the insurance company's investment risk is carried out in the context of the coefficient approach by using a set of indicators – the liquidity level ( $R_1$ ); the ratio of assets/liabilities ( $R_2$ ); participation in the equity of subsidiaries ( $R_3$ ); the ratio between equity and debt securities in the portfolio structure ( $R_4$ ); the ratio between the liquid and current assets ( $R_5$ ); the level of investments' profitability ( $R_6$ ), which directly or indirectly determines the likelihood of financial losses.

The algorithm for the assessment of characteristics of insurance companies' investment activities and their qualitative interpretation is presented in Figure 1, where the following parameters are used:  $P^+$  – the sum of probabilities for the market conditions in which the value of the indicator is higher than average;  $x_i$  – the value of the corresponding indicator;  $M(x)$  – the average value of the indicator;  $N(x)$  – standard value of the indicator,  $a_i$  – the indicator of deviations that are higher than average.

Thus, the assessment of characteristics of the insurance companies' investment activity is a link between the analysis and managerial decision-making regarding investments. The proposed method allows to make a quantitative and qualitative assessment of the investment activity characteristics and to develop the necessary steps to enhance its development.

The study of modern economic processes makes it possible to define the potential users who are interested in receiving information about the quantitative assessment of characteristics of insurance companies' investment activity. Therefore, the key consumers of the above mentioned information may be: state regulatory authorities (changing the rules on the disposition of insurance funds; inclusion of the results of assessment of insurance companies' investment activity into analytical reports of state regulatory agencies; defining the ways of reforms and preparation of recommendations regarding the strategic development of insurance companies' invest-

ment activity); financial institutions (assessing the potential for the expansion of the resource base of financial institutions due to the accumulation of insurance companies' resources); insurance companies

(in determining the possibilities to expand their investment activity; evaluating the investment positions of competing companies in the market and the choice of investment strategies).

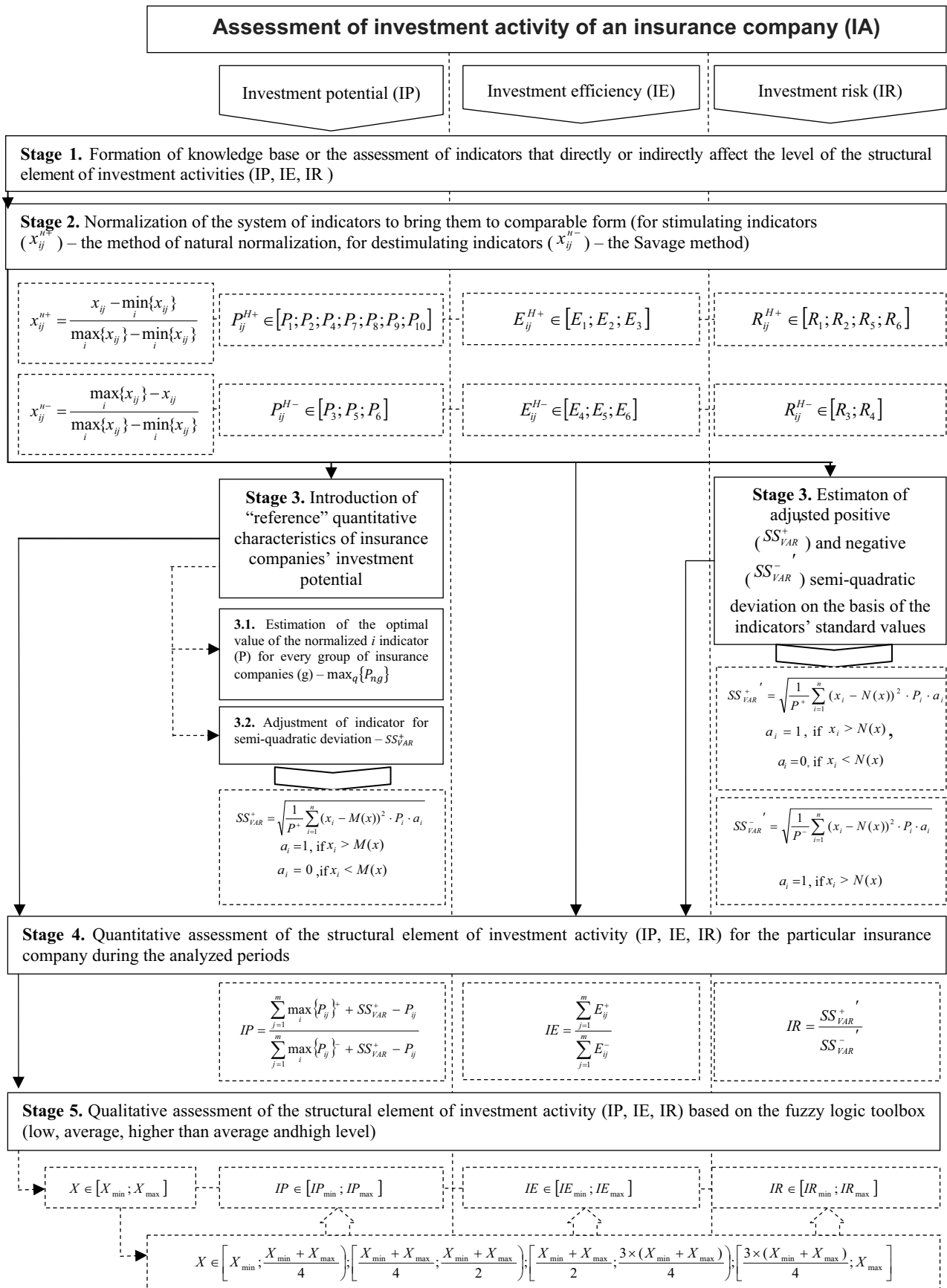
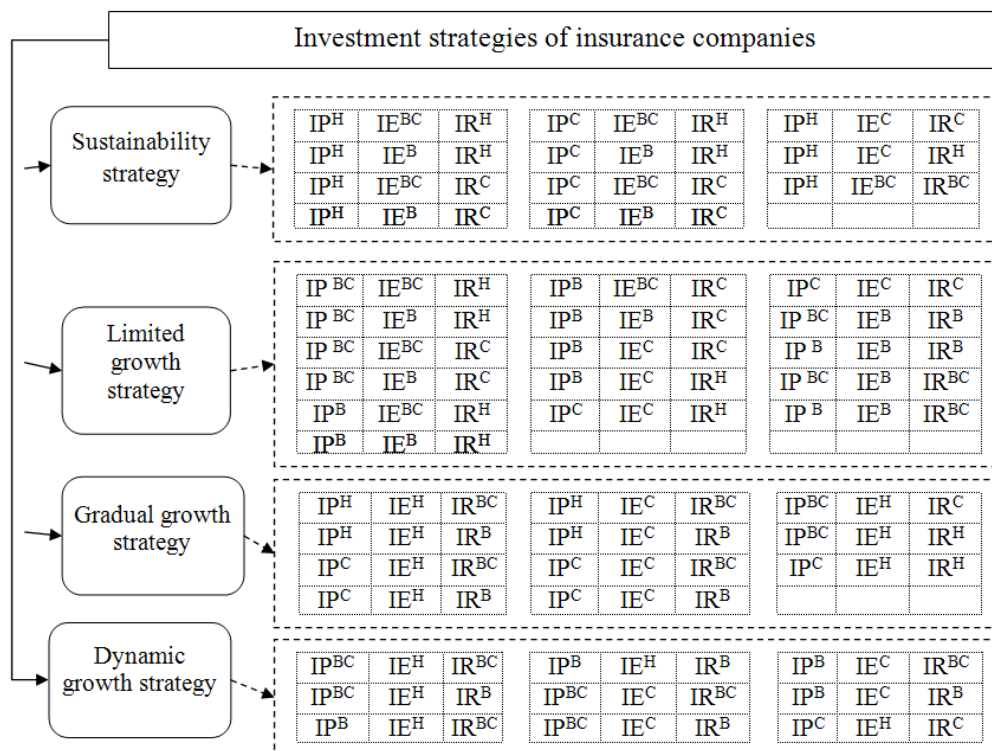


Fig. 1. Algorithm for assessing an insurance company's investment activity

Considering the system-forming role of investment activity in the development of the insurance business as well as the strengthening of the company's competitive positions in the market, this paper offers a detailed study of strategic aspects in the development of investment activities. The proposed approach to the formation of investment strategies is based not only on the research of investment environment in which the insurance company operates, but also takes into account investment opportunities of the company and provides for the achievement of a certain level of financial performance by the insurance company during the realization of its investment strategy. In

other words, the process of investment strategies' selection depends on the characteristics of investment activity (investment potential, investment performance and investment risk) paying attention to the influence of exogenous factors of the market environment.

Depending on the combination of characteristics of insurance companies' investment activity it is proposed to use strategies to maintain the achieved investment position (sustainability strategy, limited growth strategy) and to expand investment activities (gradual growth strategy and dynamic growth strategy) (Figure 2).



Notes: H – low level; C – average level; BC – higher than average level; B – high level.

**Fig. 2. Types of insurance companies' investment strategies**

The starting points of any strategy should be: the investment of resources into investment objects must guarantee their return with appropriate margin; the allocation of funds should be carried out taking into account the norms of insurance legislation; money flows of a company should be synchronized with fulfillment of insurance liabilities, etc.

We will analyze each of insurance companies' investment strategies.

Sustainability strategy is typical for companies, which wish to maintain their achieved investment positions and to preserve the existing growth rates of companies' value. Insurance companies that have chosen this strategy possess a diversified investment portfolio, an extensive use of investment potential and high economic efficiency of investments.

Limited growth strategy can also be referred to in terms of maintaining the achieved positions. The main difference between this and the previous strategy is the need to increase the volume of investment transactions, as the efficiency level of insurance companies' investment activity is very high. Consequently, the management of an insurance company needs to focus on the use of the existing investment potential.

Gradual growth strategy is recommended for insurance companies with low levels of investment activity's efficiency despite their active participation in it. In this regard it is necessary to change the existing approach toward the formation of investment portfolios, increasing the share of more profitable financial instruments.

Dynamic growth strategy is aimed at improving all characteristics of investment activity and involves a radical change of approaches to the organization of investment processes. Companies that have chosen this strategy should redirect their significant unused investment potential into profitable investment projects.

On the basis of characteristics of investment activities and considering the environmental factors we can identify a set of investment strategies for insurance companies making it possible to determine the existing and to develop a desired strategy.

Along with the implementation of the scientific and methodological approach for estimating the characteristics of insurance companies' investment activity and development of their investment strategies it is important to check the adequacy of the proposed method in practice. In order to ensure the representativeness of the sample we selected 10 life insurance companies of Ukraine, which account for about 89.8% of collected premiums:

Private Joint-Stock Company "GRAWE Ukraine Life Insurance", Private Joint-Stock Company "ALIKO Ukraine", "Ukrainian Joint-Stock Insurance Company ASKA Life", Private Joint-Stock "Insurance Company UNIQA Life", Private Joint-Stock Insurance Company "Oranta Life", Private Joint-Stock Life Insurance Company "Universal", Private Joint-Stock Insurance Company "KD-Life", Private Joint-Stock Insurance Company "EKKO", Private Joint-Stock Company "Ukrainian Insurance Company Garant-Life", Private Joint-Stock Company "Jupiter Life Insurance".

During the testing of the method to evaluate the investment activity we have used the information and statistical basis for calculating the indicators in the context of a single insurance company ( $n = 10$ ) for the period of 2007-2012. On the basis of the proposed algorithm for the assessment of investment activity (Figure 1) we have conducted numerous mathematical calculations to assess the levels of investment potential, the efficiency of investment activity and investment risk, the final results of which are presented in Table 1 (see Appendix), where the following symbols were used: H – lower limit of the indicator's threshold level, B – upper limit of the indicator's threshold level.

The analysis of the data presented in Table 1 suggests that the majority of insurance companies in Ukraine are efficient using their investment potential, putting nearly a third of their financial resources into bank deposits. The study of the efficiency of insurance companies' investment activity in Ukraine shows the tendency toward the reduction of its level since 2008 because of the growth of investors' negative expectations due to the constant structural disbalances

in the domestic stock market, the falling profitability of financial instruments and higher investments risks. In these conditions, there is an objective need to improve the system of the assets' and liabilities' management determining the strategic vector of an insurance company' development.

Depending on the correlation of investment activity characteristics it is proposed to form insurance companies' investment strategies for the periods of three years, in particular, for the periods of 2010-2012 and 2013-2015 (Table 2).

Table 2. Formalization of investment strategies for life insurance companies in Ukraine for the periods 2010-2012 and 2013-2015

Company name	Period 1 (2010-2012)	Period 2 (2013-2015)
1. GRAWE Ukraine	IP <sup>H</sup> IE <sup>C</sup> IR <sup>H</sup> <i>Sustainability strategy</i>	IP <sup>H</sup> IE <sup>B</sup> IR <sup>H</sup> <i>Sustainability strategy</i>
2. ALIKO Life	IP <sup>C</sup> IE <sup>H</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>	IP <sup>C</sup> IE <sup>C</sup> IR <sup>H</sup> <i>Limited growth strategy</i>
3. ASKA Life	IP <sup>B</sup> IE <sup>B</sup> IR <sup>C</sup> <i>Limited growth strategy</i>	IP <sup>C</sup> IE <sup>C</sup> IR <sup>C</sup> <i>Gradual growth strategy</i>
4. UNIQA Life	IP <sup>B</sup> IE <sup>H</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>	IP <sup>C</sup> IE <sup>H</sup> IR <sup>C</sup> <i>Dynamic growth strategy</i>
5. Oranta Life	IP <sup>B</sup> IE <sup>H</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>	IP <sup>C</sup> IE <sup>H</sup> IR <sup>C</sup> <i>Dynamic growth strategy</i>
6. Universal	IP <sup>C</sup> IE <sup>Y</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>	IP <sup>C</sup> IE <sup>H</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>
7. KD-Life	IP <sup>C</sup> IE <sup>H</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>	IP <sup>B</sup> IE <sup>H</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>
8. EKKO	IP <sup>C</sup> IE <sup>C</sup> IR <sup>H</sup> <i>Limited growth strategy</i>	IP <sup>C</sup> IE <sup>C</sup> IR <sup>H</sup> <i>Limited growth strategy</i>
9. Jupiter	IP <sup>B</sup> IE <sup>H</sup> IR <sup>C</sup> <i>Gradual growth strategy</i>	IP <sup>C</sup> IE <sup>Y</sup> IR <sup>H</sup> <i>Gradual growth strategy</i>
10. Garant-Life	IP <sup>C</sup> IE <sup>H</sup> IR <sup>C</sup> <i>Dynamic growth strategy</i>	IP <sup>C</sup> IE <sup>H</sup> IR <sup>C</sup> <i>Dynamic growth strategy</i>

According to the developed method the majority of insurance companies should follow the investment activity's expansion strategies of gradual and dynamic growth. A detailed analysis of investment strategies within the designated groups made it possible to identify certain patterns: the strategic goal of companies in group 1 is to maintain the achieved investment positions; companies in groups 2 and 3 should actively develop their investment activities.

## Conclusion

With the increasing competition in the market the development of insurance companies is possible through a realization of measures aimed at boosting investment activities and determining their strategic directions. In the process of development and selection of investment strategies it is necessary to take into account the level of internal investment resources of insurance companies as well as changes in external conditions of their functioning, which can cause the need to adjust the set goals and objectives.

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Table 1. The characteristics of investment activity of life insurance companies in Ukraine for the period of 2007-2012

Characteristics of investment activity			Insurance companies										The scale of investment activity levels
			GRAWE Ukraine	ALIKO Life	ASKA Life	UNIQA Life	Oranta Life	Universal	KD-Life	EKKO	Jupiter	Garant-Life	
Investment potential	2007	H	0.025	1.195	4.165	2.159	2.929	1.220	2.046	2.099	2.099	0.897	Low level [0,00-1,70]; average level [1,70-3,40]; higher than average level [3,40-5,10]; high level [5,10-6,79]
		B	1.106	2.276	5.624	3.618	4.388	2.301	3.127	3.179	6.754	1.978	
	2008	H	0.638	3.580	3.596	2.918	4.101	1.857	1.271	1.271	0.978	2.000	
		B	1.718	5.039	5.055	4.377	6.794	2.938	2.351	2.351	2.059	3.081	
	2009	H	0.474	1.278	1.016	3.952	2.207	1.670	0.831	0.831	3.710	1.405	
		B	1.555	2.359	2.097	6.645	3.288	2.751	1.911	1.911	5.169	2.486	
	2010	H	0.202	0.533	1.700	1.304	1.550	2.312	2.996	2.996	1.600	1.977	
		B	1.282	1.614	2.780	2.384	2.631	3.771	4.455	4.455	2.090	3.057	
	2011	H	0.243	1.727	0.677	1.376	1.819	2.021	2.943	2.943	0.859	2.648	
		B	1.323	2.808	1.757	2.456	2.899	3.101	4.402	4.402	1.939	4.108	
	2012	H	0.337	2.067	1.493	2.140	2.560	2.046	3.571	3.571	2.508	0.000	
		B	1.417	3.526	2.573	3.220	4.019	3.127	5.030	5.030	3.968	0.000	
Efficiency of investment activity	2007	H	0.617	0.163	0.528	0.047	0.000	0.001	0.001	0.000	0.149	0.693	Low level [0,00-0,62]; average level [0,62-1,24]; higher than average level [1,24-1,86]; high level [1,86-2,49]
		B	0.896	0.454	0.807	0.338	0.260	0.292	0.292	0.145	0.440	0.972	
	2008	H	0.820	0.077	0.650	0.081	0.000	0.134	0.134	0.000	0.000	0.538	
		B	1.919	0.368	0.929	0.372	0.185	0.425	0.425	0.145	0.287	0.817	
	2009	H	0.878	0.322	0.133	0.015	0.000	0.000	0.000	0.000	0.082	0.000	
		B	1.976	0.613	2.052	0.306	0.156	0.259	0.259	0.271	0.373	0.251	
	2010	H	0.333	0.863	0.079	0.000	0.000	0.067	0.067	0.192	0.149	0.000	
		B	2.252	1.141	1.997	0.282	0.224	0.358	0.358	0.483	0.440	0.211	
	2011	H	0.567	0.835	0.472	0.000	0.000	0.023	0.023	0.217	0.118	0.242	
		B	2.485	1.114	0.750	0.215	0.145	0.314	0.314	0.508	0.409	0.532	
	2012	H	0.314	0.607	0.167	0.000	0.000	0.244	0.244	0.287	0.288	0.168	
		B	2.233	0.886	0.458	0.155	0.149	0.535	0.535	0.578	0.579	0.459	



Table 1 (cont.). The characteristics of investment activity of life insurance companies in Ukraine for the period of 2007-2012

			Insurance companies										The scale of investment activity levels
			GRAWE Ukraine	ALIKO Life	ASKA Life	UNIQA Life	Oranta Life	Universal	KD-Life	EKKO	Jupiter	Garant-Life	
Characteristics of investment activity	Investment risk	2007	H	0.000	2.908	0.000	4.093	1.235	0.000	0.000	3.783	8.872	Low level [0,00-2,43]; average level [2,43-4,86]; higher than average level [4,83-7,28]; high level [7,28-9,71]
			B	1.071	4.439	1.071	5.624	3.377	1.071	1.071	5.924	9.654	
		2008	H	0.000	0.000	1.647	0.000	0.000	0.825	0.000	1.374	0.000	
			B	2.440	1.071	3.788	1.071	1.789	2.966	1.380	3.515	1.071	
		2009	H	0.492	8.603	0.891	0.105	0.983	3.529	0.000	0.000	0.390	
			B	2.633	9.386	3.032	2.246	3.124	5.670	1.383	1.071	2.531	
		2010	H	0.000	0.066	0.918	0.099	0.000	0.359	0.000	0.000	1.274	
			B	2.207	9.712	3.059	2.241	1.417	2.500	1.190	1.071	3.415	
		2011	H	0.000	0.073	3.051	1.421	0.000	0.000	0.000	2.123	2.821	
			B	2.215	1.071	4.582	3.562	1.463	1.071	1.137	4.265	4.962	
		2012	H	1.626	0.000	4.831	3.411	0.000	0.832	0.000	2.382	7.344	
			B	3.768	1.071	6.362	5.552	1.516	2.974	1.071	4.523	8.126	